

## EGS CONFIDENCE TEST EXECUTION COVER SHEET

1. Test ID and Title: EOC - ICC/IST Interface Confidence Test - ICT13
2. Test Conductor / Test Lead: Steven War
3. Planned Execution Date: \_\_\_\_\_
4. Actual Execution Date: \_\_\_\_\_
5. Planned Configuration:

Hardware: CERES IST, MOPITT IST, MISR IST, MODIS IST, EOC, and EBnet

Software: IST Software and EOC

6. “As Run” Configuration:
7. Package items planned for execution:  
  
(List test cases or steps planned for execution, e.g. ICT10.1, ICT10.2 steps 2-5, etc.)
8. Package items actually executed and deviations from currently published procedures.
9. Results
  - a. Capabilities successfully demonstrated
  - b. Capabilities not successfully demonstrated
  - c. Requirements verified
  - d. Discrepancy Reports submitted
10. Lessons Learned

## **EOC - ICC/IST Interface Confidence Test - ICT13**

### Background Information:

The IST is a subset of the Flight Operations Segment (FOS) software developed to enable the Instrument Operations Teams (IOTs) to conduct the following broad functions:

- Instrument activity planning and scheduling,
- Instrument commanding,
- Instrument telemetry monitoring and analysis,
- Update instrument's software,
- Receive image (micro-processor memory dump) of instrument's software.

Interfaces with ASTER are contained in ICT14 EOC-ASTER GDS Interface Confidence Test and ICT11 EDOS-ASTER GDS Interface Confidence Test and will not be tested within this confidence test.

Many of the functions and tools provided by the IST are also common to the EOS Operations Center (EOC). The general architecture of the IST is a set of tools interfacing to the users through a corresponding set of Graphic User Interfaces (GUIs). The GUIs provide the user interface to functions provided locally and functions provided in client-server mode by the FOS in the EOC.

### Test Objectives:

#### **ICT 13.1 - Infra-structure or Stand-alone Tool Testing**

The objective of ICT 13.1 is to verify that the individual tools perform their assigned functions properly as stand-alone entities. IST stand alone tests should be able to build on developer I&T efforts and resources including automated execution scripts (X-runner scripts) and test data. The planning approach will be to represent each tool as a stand alone entity implemented by the corresponding GUI. Resulting products will be used in subsequent tests to test transitions between states. All available stand alone tools will be tested during this phase.

While the confidence tests will include all of these tools (other than those identified as COTS), specific tools will be tested as they become available (Release A or B). Regression testing will also be included during Release B timeframe for those tools which were originally included with Release A.

#### **ICT 13.2 - IST Operational Scenario Tests**

In ICT 13.2, the IST tools are used to support instrument operations test scenarios. These are tests of “end-to-end” functionality for the IST integrated with the EOC.

### **ICT 13.3 - Simultaneous Users and Management Mode**

In ICT 13.3 potential conflicts between various IST users are tested. For example, simultaneous dedicated users will access the system, along with non-dedicated users to ensure the system correctly correlates the information presented to it. Additionally, a single user will log on with management authority, and a second user will attempt to log on in management mode. After the second user is denied management mode, the first user will log off and the system will be tested to ensure the user still logged on can then access those commands requiring management mode authority. Tests will also be run to ensure ASTER users do not affect the number of users allowed to be logged into the system from ISTs.

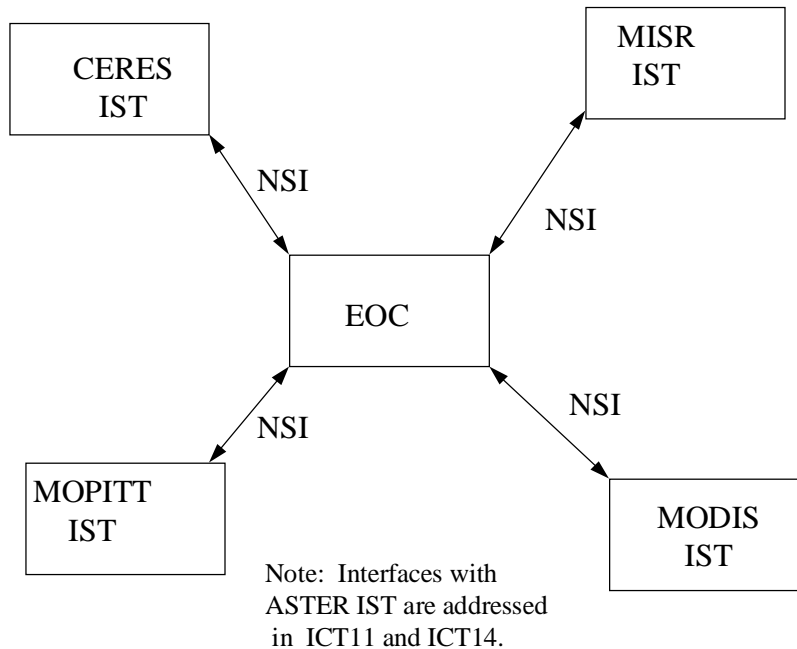
#### Requirements to be Verified:

EOC-2230#B, EOC-2240#B, EOC-2250#A, EOC-2250#B, EOC-2260#B, EOC-2270#A, EOC-2270#B, EOC-2272#A, EOC-2272#B, EOC-2290#A, EOC-2290#B, EOC-2350#A, EOC-2350#B, EOC-2480#A, EOC-2480#B, EOC-2540#A, EOC-2540#B, EOC-2620#A, EOC-2620#B, EOC-3020#A, EOC-3020#B, EOC-3030#A, EOC-3030#B, EOC-3200#B, EOC-3225#B, EOC-3226#B, EOC-4015#A, EOC-4015#B, EOC-4017#C, EOC-4166#B, EOC-4168#B, EOC-4210#B, EOC-6020#A, EOC-6020#B, EOC-7015#A, EOC-7015#B, EOC-7125#C, EOSD1500#B, ICC-0010#B, ICC-0020#B, ICC-0030#A, ICC-0030#B, ICC-0055#A, ICC-0055#B, ICC-0070#B, ICC-1130#B, ICC-1150#C, ICC-2010#A, ICC-2010#B, ICC-2015#B, ICC-2050#A, ICC-2050#B, ICC-2052#B, ICC-2060#B, ICC-2110#B, ICC-2115#B, ICC-2140#A, ICC-2140#B, ICC-2150#A, ICC-2150#B, ICC-2170#A, ICC-2190#A, ICC-2190#B, ICC-2210#A, ICC-2210#B, ICC-2220#A, ICC-2220#B, ICC-2230#A, ICC-2230#B, ICC-2250#A, ICC-2250#B, ICC-2270#A, ICC-2270#B, ICC-2280#A, ICC-2280#B, ICC-2290#A, ICC-2290#B, ICC-2300#A, ICC-2300#B, ICC-2350#B, ICC-2370#B, ICC-2380#B, ICC-2390#A, ICC-2390#B, ICC-2400#A, ICC-2400#B, ICC-3010#A, ICC-3010#B, ICC-3020#B, ICC-3040#A, ICC-3040#B, ICC-3050#B, ICC-3060#B, ICC-3070#B, ICC-3071#B, ICC-3085#B, ICC-3090#A, ICC-3090#B, ICC-3100#A, ICC-3100#B, ICC-3110#A, ICC-3110#B, ICC-3210#A, ICC-3210#B, ICC-3230#B, ICC-3262#C, ICC-3270#A, ICC-3270#B, ICC-3280#C, ICC-3300#C, ICC-3360#C, ICC-3370#B, ICC-3430#C, ICC-4020#A, ICC-4020#B, ICC-4045#A, ICC-4045#B, ICC-4050#B, ICC-4060#B, ICC-4070#B, ICC-4090#A, ICC-4090#B, ICC-4095#B, ICC-4100#A, ICC-4100#B, ICC-4110#B, ICC-4120#B, ICC-4130#B, ICC-4150#A, ICC-4150#B, ICC-4160#C, ICC-4170#B, ICC-4410#A, ICC-4410#B, ICC-4420#A, ICC-4420#B, ICC-4440#B, ICC-4450#A, ICC-4450#B, ICC-4460#A, ICC-4460#B, ICC-4470#A, ICC-4470#B, ICC-4480#B, ICC-4490#A, ICC-4490#B, ICC-4500#B, ICC-4510#B, ICC-4520#C, ICC-4540#B, ICC-4545#B, ICC-4550#A, ICC-4550#B, ICC-4560#A, ICC-4560#B, ICC-4570#B, ICC-4580#B, ICC-4590#B, ICC-4600#B, ICC-4710#A, ICC-4710#B, ICC-4720#B, ICC-4730#B, ICC-4740#A, ICC-4740#B, ICC-4760#A, ICC-4760#B, ICC-4775#A,

ICC-4775#B, ICC-4780#A, ICC-4780#B, ICC-4790#A, ICC-4790#B, ICC-6005#A, ICC-6005#B, ICC-6010#B, ICC-6020#A, ICC-6020#B, ICC-6030#B, ICC-6040#A, ICC-6040#B, ICC-6060#A, ICC-6060#B, ICC-6070#A, ICC-6070#B, ICC-6090#B, ICC-6110#B, ICC-6130#B, ICC-6135#B, ICC-6140#B, ICC-6150#B, ICC-6510#A, ICC-6510#B, ICC-6520#A, ICC-6520#B, ICC-6525#A, ICC-6525#B, ICC-6540#A, ICC-6540#B, ICC-6580#A, ICC-6580#B, ICC-6600#A, ICC-6600#B, ICC-7060#A, ICC-7070#A, ICC-8010#B, ICC-8020#B, & ICC-8050#B.

See Appendix A for the text of the requirements.

Test Configuration (for AM-1):



Participants and Support Requirements:

Participants:

Maximum number of simultaneous AM-1 IST users is 15 (all missions).

Dedicated simultaneous IST connections

CERES	4 at Langley
MODIS	2 at GSFC
MOPITT	1 at Un of Toronto, 1 at NCAR in Boulder
MISR	2 at JPL

Non-dedicated connections

CERES	4 at Langley
MODIS	1 at GSFC

MISR 1 at JPL

DAAC support personnel at selected ISTs  
I&T TC  
EOC M&O (FOT)  
EDOS M&O  
EBnet

Comm:

Voice: SCAMA or CCL  
Data: EBnet - circuit from EOC - GSFC DAAC

Equipment & Software:

Hardware:

CERES IST  
MOPITT IST  
MISR IST  
MODIS IST  
EOC  
EBnet

Software:

IST Software  
EOC Software

Equipment & S/W: IST at IT facilities  
EOC - Data Server, Workstation  
EOC S/W  
EOC Equipment

Test Tools:

Test Data:

Description / Characteristics	Source	File/Script & Location
Telemetry data	ETS	

## References:

Hughes Information Technology Corporation, 343-TP-001-001, IST Capabilities Document for the ECS Project, September 1995.

## Test Case Descriptions:

### **ICT 13.1**

#### **ICT 13.1.1 Planning & Scheduling Tools**

The Activity Definer will be used to define activities for several different instruments. Once this is accomplished the Basic Activity Profile (BAP) will be used to incorporate a number of activities to be scheduled for the instrument's routine operation. The Scheduler will then be used to schedule individual activities as well as BAPs. Following this exercise the Plan Tool will be used to establish accesses, permissions or locks on plans maintained by Planning and Scheduling. Finally the Timeline Tool will be used to view the currently planned activities, orbit events and constraints and accesses on a given plan for a given time interval.

Requirements to be Verified: TBD

#### **ICT 13.1.2 Command Management Tools**

The RTS Load Builder will be used at the IST to create and edit Relative Time Sequence (RTS) load contents. Once that is accomplished the user will create and edit table load contents using the Table Load Builder. The Load Ingest Tool will be used to load contents files that were created at the IST to the FOS. The Load Generator Tool will be used to convert the load contents files to uplink format and enter them into the FOS Load Catalog. The Load Scheduler Tool will be used by the IOT to schedule the uplink times for the various instrument loads including microprocessor loads, table loads and RTS loads. The Load Manager Tool is used to launch the Load Schedule Tool. The Dump Comparison is requested via the ECL line in the control window and instructs the FOS software to compare the dump file to a load file and identify the differences. Finally, the Dump Report is used to export the file from the FOS to the SCF using the Data Mover tool. All CMS reports are accessible from the IST. The IOT user will use the IST to view ATC Load Reports, Table Load Reports, Microprocessor Load Reports, and an Integrated Report. The Monitor Telemetry Tools will allow an IST user to monitor instrument housekeeping and instrument engineering telemetry that is being received and processed in real time at the EOC. Full replay control will be given to the User through the Replay Controller Tool. Finally, the Quick Analysis Tool will be used to perform several analysis on the data.

Requirements to be Verified: TBD

#### **ICT 13.1.3 Analysis Request Builder**

From an IST, a user can initiate an analysis by bringing up the analysis request builder. They will then build a request by choosing instrument housekeeping telemetry, raw values or Engineering United Converted values and a sampling rate for each parameter specified. Additional parameters, along with the corresponding user algorithms will be selected, and a contiguous interval of time. The user will be provided a predefined report format. A user defined report will be created next using the corresponding report template. A Standing Order will be generated and scheduled using the Standing Order Manager. Finally the results of the Standing Order Manager will be viewed using the Standing Order Browser.

Requirements to be Verified: TBD

#### **ICT 13.1.4 Commanding**

The Procedure Builder Tool will be used by the IST user to create, edit, delete and print procedures. The Command Activity Controller will be used to execute any procedure that contains instrument commands. The Command Builder will be used to create commands. The user can use the Command Request tool to submit command requests to the Ops Controller. A command request consists of a set of instrument commands and instructions. The Command Request Status window will be used by the IOT for this purpose. During the execution of the current ground script the IST allows the IOT member to monitor the activities using the Command Monitoring Tool. The corresponding ground scripts are monitored using the Ground Script Display.

Requirements to be Verified: TBD

#### **ICT 13.1.5 Subsystem**

The IST enables the IST user to view event messages about the EOC, IST, spacecraft and instruments. Event messages are color coded on the event display to indicate the event severity and event type. The IST user will view event messages and perform Database Update & Browse functions.

Requirements to be Verified: TBD

#### **ICT 13.1.6 Tools**

The IST user will also exercise the following tools: the Help function, the Display Builder, the Quick Message Generator, the Data Mover to move files from the local workstation to the FOS, the Time Selector and other various Reports.

## **ICT 13.2**

**ICT 13.2.1 Instrument Planning and Scheduling** - Define a BAP and independent activities and submit them to the EOC. Display the current instrument activity timeline. Modify the BAP and independent activities and resubmit them to the EOC for re-scheduling. Conflicting schedules for various instruments will also be included to ensure accurate activity level constraint checking.

**ICT 13.2.2 Instrument Commanding** - Edit, validate, and generate Relative Time Sequence (RTS) and Table Loads and schedule them for uplink. Ensure both “in bounds” variables, and “out of bounds” variables to activities are handled correctly. Select existing loads from the load catalog and schedule them for uplink. Following load uplink, request memory dump and dump processing from the EOC and review results. Create and submit to the EOC ECS Command Language (ECL) procedures for real time instrument commanding. Execute these procedures, within the EOC, and verify command execution through telemetry monitoring.

**ICT 13.2.3 Telemetry Monitoring and Analysis** - Create alphanumeric and graphic telemetry displays and exercise them with single and multiple logical string connections, including a playback connection. Conduct a Quick Analysis on a telemetry stream from the IST. Submit Analysis Requests to the EOC for more extensive analysis and transfer results back to the IST. Analysis processing will also be performed at the IST. Issue standing order analysis requests to the EOC and verify regular execution. Various reports will also be generated.

**ICT 13.2.4 Instrument Data Base Updates** - conduct data base access and updates to instrument parameters from the IST. Upon approval and transfer to the permanent tables, verify proper updates in the permanent tables.

**ICT 13.2.5 Flight Software Updates** - conduct data base access and updates to flight software from the IST. Upon approval and transfer to the permanent tables, verify proper updates in the permanent tables.

## **ICT 13.3**

### **ICT 13.3.1 Simultaneous users**

At various ISTs a number of users will log on to ensure that the software allows the correct number of users to be accessing the system at the same time.

### **ICT 13.3.2 Dedicated user accessibility**

The maximum number of non-dedicated users will be logged onto the system and then all the dedicated simultaneous users will log onto the system to ensure they are not locked out by non-dedicated users.



### ICT 13.3.3 Management Mode tests

A single individual will log onto the system in management mode for a specific instrument. This individual will perform some management functions while a second user, also authorized for management mode on the same instrument will attempt to log onto the system in management mode. If unable to log into the system in management mode, this individual will log on as a normal user and will attempt to perform management functions from that log on. A third individual will log onto the system in management mode for a second instrument and attempt to perform management functions on the first instrument. The first user will no log off and the third individual will attempt to access the first instrument.

**ICT 13.3.4** Joint test with EGS6 to ensure ASTER users (are not counted as part of the 15 users) don't effect 15 simultaneous IST users

Test Procedures:

Test Set-up:

Step	Station	Action	Expected Results	Comments
1.	IST	Logon to the Unix workstation		
2.	IST	Activate the Motif window manager		
3.	IST	Log onto the IST		

Test Execution:

### ICT 13.1

Step	Station	Action	Expected Results	Comments
ICT 13.1.1 Planning & Scheduling Tools				
1.	IST	From the tools dialog box, select PAS		
2.	IST	From PAS invoke the activity definer tool	Activity Definer window is displayed	
3.	IST	Define a new activity	Prompt to enter the name of the new activity	
4.	IST	Enter a new activity name (CERES Test1) and select AM1 CERES for resource name, select the OK button	Activity and resource name is updated	
5.	IST	Access available CERES commands	Command window is displayed with available commands	

6.	IST	Incorporate about 10 CERES ATC Commands into this activity	Commands are displayed on the screen	
7.	IST	Save this new activity as CERES Test1	Activity is saved under given name	
8.	IST	Close this activity	Activity is closed	
9.	IST	Open CERES Test1	Activity is redisplayed	
10.	IST	Delete several commands from the activity	Activity is updated as desired	
11.	IST	Save activity under CERES Test2	Activity is saved under a new name	
12.	IST	Attempt to open CERES Test1 under the MOPITT resource	System defines a new activity under that resource name	
13.	IST	Incorporate several Ground commands under this activity and save as MOPITT Test1		
14.	IST	Open CERES Test1 and add several Ground commands to it		
15.	IST	Save as CERES Test3		
16.	IST	Open CERES Test2		
17.	IST	Specify mode transition as Standby and include parameter values		
18.	IST	Save as CERES Test4		
19.	IST	Intentionally place an inconsistency within the parameters of a command	Inconsistency should be identified by system	
20.	IST	Modify the parameter to eliminate the inconsistency	System accepts the change	
21.	IST	Specify mode transition as Safe		
22.	IST	Save activity as CERES Test5		
23.	IST	Specify mode transition as Biaxial Scan		
24.	IST	Save activity as CERES Test6		

25.	IST	Create and save activities for MISR, MOPITT, & MODIS		
26.	IST	Close the Activity Definer		
27.	IST	From the tools dialog box, select PAS		
28.	IST	From PAS invoke the BAP definer & OK	BAP window is displayed	
29.	IST	Create a new BAP	Prompt to enter the name of the new BAP	
30.	IST	Enter a new BAP name (BAP1) and select AM1 for resource name, select the OK button	BAP and resource name is updated, BAP Definer screen	
31.	IST	Access available Activities and add them to BAP1		
32.	IST	Save BAP1		
33.	IST	Add additional activities to BAP1 and delete several of the previously included activities		
34.	IST	Save as BAP2		
35.	IST	Edit command parameters within an activity contained in BAP2		
36.	IST	Save as BAP3		
37.	IST	Edit activity scheduling information within BAP3		
38.	IST	Save as BAP4		
39.	IST	Close and exit BAP4		
40.	IST	Deleted BAP2		
41.	IST	From the tools dialog box, select PAS		
42.	IST	From PAS select the General Scheduler & OK	General Scheduler Main Screen is displayed	
43.	IST	Schedule an activity within a plan using impact scheduling		
44.	IST	Save the plan as PLAN1		

45.	IST	Schedule an individual command within a plan using non-impact scheduling and an absolute start time with a stop as a duration		
46.	IST	Save the plan as PLAN2		
47.	IST	Schedule an activity within a plan using non-impact scheduling with oversubscription with start associated with an orbital event and stop as an absolute time		
48.	IST	Open PLAN1		
49.	IST	Schedule communication contact with an absolute start time and a stop time associated with an orbital event		
50.	IST	Modify the command parameters		
51.	IST	Save the plan as PLAN3		
52.	IST	Schedule an uplink load		
53.	IST	Save the plan as PLAN4		
54.	IST	Delete PLAN3		
55.	IST	Open PLAN 2		
56.	IST	Unschedule an activity within PLAN2		
57.	IST	Save as PLAN5		
58.	IST	From the tools dialog box, select PAS		
59.	IST	From PAS select Timeline & OK	General Scheduler Main Screen is displayed	
60.	IST	Open PLAN5		
61.	IST	Change the resources displayed by the timeline		
62.	IST	Remove resources from the timeline		
63.	IST	Change the ordering of the displayed resources		
64.	IST	Adjust the plan for new FDF Data		

65.	IST	Save as PLAN6		
66.	IST	View Activities within plan		
67.	IST	Filter Activities within plan		
68.	IST	Reschedule Activities within the plan		
69.	IST	Save as PLAN7		
ICT 13.1.2 Command Management Tools				
70.	IST	Create RTS load using the RTS Load Builder		
71.	IST	Save the RTS load as RTSLOAD1		
72.	IST	Edit the RTS load using the RTS Load Builder		
73.	IST	Save the RTS load as RTSLOAD2		
74.	IST	Create a table load using the Table Load Builder		
75.	IST	Save the table load as TABLE1		
76.	IST	Edit the table load using the Table Load Builder		
77.	IST	Save the table load as TABLE2		
78.	IST	Use the Load Ingest Tool to load RTSLOAD2 to FOS		
79.	IST	Use the Load Ingest Tool to load TABLE1 to FOS		
80.	IST	Use the Load Ingest Tool to load an instrument microprocessor load to FOS		
81.	IST	Use the Load Generator Tool to convert RTSLOAD2 to uplink format		
82.	IST	Use the Load Generator Tool to convert TABLE1 to uplink format		

83.	IST	Use the Load Generator Tool to convert instr. Microprocessor load to uplink format		
84.	IST	Use the Load Schedule Tool to schedule the uplink times for RTSLOAD2, TABLE1 & Inst. Micro. Load		
85.	IST	Launch the Load Schedule Tool using the Load Manager Tool		
86.	IST	Using Dump Comparison, compare the dump file and the load file, identify any differences		
87.	IST	Using the Data Mover tool, export files from the FOS to the SCF		
88.	IST	View the ATC Load Report		
89.	IST	View the Table Load Report		
90.	IST	View the Microprocessor Load Report		
91.	IST	View the Integrated Report		
92.	IST	Using the Monitor Telemetry Tool, monitor the instrument housekeeping telemetry		
93.	IST	Using the Monitor Telemetry Tool, monitor the instrument engineering telemetry		
94.	IST	Using the Replay Controller Tool, replay as appropriate		
95.	IST	Using the Quick Analysis Tool, analyze the data received		
ICT 13.1.3 Analysis Request Builder				

96.	IST	Invoke the Analysis Request Builder		
97.	IST	Select Instrument H/K telemetry, associated times, sampling and statistics rates		
98.	IST	Accept the predefined report format		
99.	IST	Save request as REQUEST1		
100.	IST	Select Instrument H/K raw values, associated times, sampling and statistics rates		
101.	IST	Accept the predefined report format		
102.	IST	Save request as REQUEST2		
103.	IST	Select Instrument H/K Engineering Unit Converted values associated times, sampling and statistics rates		
104.	IST	Create a user defined report format		
105.	IST	Save request as REQUEST3		
106.	IST	Generate a Standing Order based on time		
107.	IST	Generate a Standing Order based on orbit		
108.	IST	Schedule both Standing Orders using the Standing Order Manager		
109.	IST	Using the Standing Order Browser view the two Standing Orders		
<b>ICT 13.1.4 Commanding</b>				
110.	IST	Select the New option under the File menu	An ECL template procedure is displayed	

111.	IST	Place the cursor in the procedure text window and enter ECL directives to place CERES in safe mode	The text appears as typed	
112.	IST	Select the appropriate procedure type from the option menu		
113.	IST	Save as PROCEDURE1		
114.	IST	Add additional ECL directives to the procedure		
115.	IST	Save as PROCEDURE2		
116.	IST	Select the New option under the File menu	An ECL template procedure is displayed	
117.	IST	Place the cursor in the procedure text window and enter ECL directives to place CERES in calibration mode	The text appears as typed	
118.	IST	Select the appropriate procedure type from the option menu		
119.	IST	Save as PROCEDURE3		
120.	IST	Select the New option under the File menu	An ECL template procedure is displayed	
121.	IST	Place the cursor in the procedure text window and enter ECL directives to place MODIS in safe mode	The text appears as typed	
122.	IST	Select the appropriate procedure type from the option menu		
123.	IST	Save as PROCEDURE4		
124.	IST	Select the Open option under file menu	A file selection dialog is displayed	
125.	IST	Select the User button	The contents of the user defined procedure directory are displayed	
126.	IST	Navigate through the choices and select PROCEDURE1 and select OK	PROCEDURE1 is displayed for modification	



127.	IST	Update the ECL directives in PROCEDURE1	ECL directives are modified appropriately	
128.	IST	Save as PROCEDURE5		
129.	IST	Select the Open option under file menu	A file selection dialog is displayed	
130.	IST	Select the System button	All procedures are displayed for the user's selection	
131.	IST	Navigate through the choices and select PROCEDURE3 and select OK	PROCEDURE3 is displayed for modification	
132.	IST	Update the ECL directives in PROCEDURE3	ECL directives are modified appropriately	
133.	IST	Save as PROCEDURE3		
134.	IST	Print PROCEDURE3	File is printed	
135.	IST	Select the insert option under the File menu	A file selection dialog is displayed	
136.	IST	Navigate through the choices and select PROCEDURE1 and select OK	Selected procedure is inserted within PROCEDURE3	
137.	IST	Enter the Start directive (Start <procedure name>) in the ECL text field		
138.	IST	Obtain command authority with the TAKE COMMAND directive	User has authority to execute commands	
139.	IST	Select Command Control from the Command Control Window	Command Control Window becomes activated	
140.	IST	Enter the Start directive (Start <procedure name>)		
141.	IST	Using Command Builder, create commands for MOPITT		

142.	IST	Using Command Builder, create commands for MISR		
143.	IST	Using the Command Request tool, submit command requests for MOPITT and MISR to the Ops Controller	The Command request Status window is used for this procedure	
144.	IST	Using the Command Monitoring tool monitor activities throughout this operation		
145.	IST	Using the Ground Script Display, monitor the corresponding ground scripts during this operation		
ICT 13.1.5 Subsystem				
146.	IST	View event messages pertaining to the EOC		
147.	IST	Using the Database Browse function browse values in the database related to the event		
148.	IST	View event messages pertaining to the IST		
149.	IST	Using the Database Update function change values in the database related to the event		
150.	IST	View event messages pertaining to the spacecraft		
151.	IST	View event messages pertaining to the CERES		
152.	IST	Using the Database Browse function browse values in the database & update them as necessary		
153.	IST	View event messages pertaining to the MODIS		
ICT 13.1.6 Tools				

154.	IST	Access and view the context sensitive help for several areas of the screen		
155.	IST	Access and test the Display Builder		
156.	IST	Access and test the Quick Message Generator		
157.	IST	Access the Data Mover and move files between FOS and your workstation		
158.	IST	Access and use the Time Selector		

### ICT 13.2

Step	Station	Action	Expected Results	Comments
ICT 13.2.1 Instrument Planning and Scheduling				
1.	IST	From the tools dialog box, select PAS		
2.	IST	From PAS invoke the BAP definer & OK	BAP window is displayed	
3.	IST	Create a new BAP	Prompt to enter the name of the new BAP	
4.	IST	Enter a new BAP name (BAP5) and select AM1 for resource name, select the OK button	BAP and resource name is updated, BAP Definer screen	
5.	IST	Select several independent activities		
6.	IST	Submit BAP and independent activities to the EOC		
7.	IST	Display the current activities timeline		
8.	IST	Modify BAP5		
9.	IST	Select several independent activities		
10.	IST	Submit modified BAP and independent activities to the EOC		

11.	IST	Display the current activities timeline		
12.	IST	Modify independent activities		
13.	IST	Submit modified independent activities and BAP5 to the EOC		
14.	IST	Display the current activities timeline		
15.	IST	Schedule activities with conflicting schedules and submit to EOC		
ICT 13.2.2 Instrument Commanding				
16.	IST	Open RTSLOAD1		
17.	IST	Modify RTSLOAD1's parameters to add "out of bounds" variable to activity		
18.	IST	Schedule RTSLOAD1 for uplink		
19.	IST	Open RTSLOAD2		
20.	IST	Ensure RTSLOAD2's parameters are "in bounds"		
21.	IST	Schedule RTSLOAD2 for uplink		
22.	IST	Open TABLE1		
23.	IST	Schedule TABLE1 for uplink		
24.	IST	Open TABLE2		
25.	IST	Schedule TABLE2 for uplink		
26.	IST	Request appropriate memory dumps from EOC for RTSLOAD1, RTSLOAD2, TABLE1, & TABLE2		
27.	IST	Create EOC ECL procedures for Real Time Instrument Commanding		
28.	IST	Submit Real Time ECL procedures		

29.	IST	Execute Real Time ECL procedures		
30.	IST	Verify command execution through telemetry monitoring		
ICT 13.2.3 Telemetry Monitoring and Analysis				
31.	IST	Create alphanumeric telemetry displays		
32.	IST	Create graphic telemetry displays		
33.	IST	Create combined alphanumeric and graphic telemetry displays		
34.	IST	Create a single logical string connection for telemetry display		
35.	IST	Create multiple logical string connections for telemetry display		
36.	IST	Create logical string connection which includes playback		
37.	IST	Conduct a Quick Analysis on a telemetry stream		
38.	IST	Submit Analysis Request to EOC for an extensive analysis		
39.	IST	Transfer results of analysis at EOC to IST		
40.	IST	Perform analysis on telemetry data on IST		
41.	IST	Issue Standing Order analysis requests from IST to EOC		
42.	IST	Verify regular execution of Standing Order		
43.	IST	Generate additional reports		
ICT 13.2.4 Instrument Data Base Updates				
44.	IST	Access database containing MOPITT information		

45.	IST	Update MOPITT database information		
46.	IST	Obtain required approvals to update data base information for MOPITT		
47.	IST	Transfer updated information to MOPITT database		
48.	IST	Verify updated MOPITT information is in MOPITT database		
49.	IST	Access database containing MODIS information		
50.	IST	Update MODIS database information		
51.	IST	Obtain required approvals to update data base information for MODIS		
52.	IST	Transfer updated information to MODIS database		
53.	IST	Verify updated MODIS information is in MODIS database		
54.	IST	Access database containing MISR information		
55.	IST	Update MISR database information		
56.	IST	Obtain required approvals to update data base information for MISR		
57.	IST	Transfer updated information to MISR database		
58.	IST	Verify updated MISR information is in MISR database		

59.	IST	Access database containing CERES information		
60.	IST	Update CERES database information		
61.	IST	Obtain required approvals to update data base information for CERES		
62.	IST	Transfer updated information to CERES database		
63.	IST	Verify updated CERES information is in CERES database		
ICT 13.2.5 Flight Software Updates				
64.	IST	Access database containing flight software information		
65.	IST	Update flight software information		
66.	IST	Obtain required approvals to update flight software information for CERES		
67.	IST	Transfer updated information to flight software database		
68.	IST	Verify updated flight software information is in CERES database		

### ICT 13.3

Step	Station	Action	Expected Results	Comments
ICT 13.3.1 Simultaneous users				
69.	IST	Have four CERES users log on to their dedicated workstations at Langley		
70.	IST	Have two MODIS users log on to their dedicated workstations at GSFC		

71.	IST	Have two MOPITT users log on to their dedicated workstations at Un of Toronto and at NCAR in Boulder		
72.	IST	Have two MISR users log on to their dedicated workstations at JPL		
73.	IST	Have four CERES users log on to their non-dedicated workstations at Langley		
74.	IST	Have one MISR user log on to their non-dedicated workstations at JPL		
75.	IST	Have one MODIS user attempt to log on to their non-dedicated workstations at GSFC	System should not allow 16th person to log onto their IST	
76.	IST	Have one of the two MODIS users logged on to their dedicated workstations at GSFC, log off		
77.	IST	Have one MODIS user log on to their non-dedicated workstations at GSFC	System should allow 15th person to log onto their IST	
ICT 13.3.2 Ensure dedicated simultaneous users are not locked out by non-dedicated users				
78.	IST	Have the second MODIS users attempt to log on to their dedicated workstations at GSFC	System should not allow 16th person to log onto their IST	
79.	IST	Have one of the four CERES users log on to their dedicated workstations at Langley, log off		
80.	IST	Have the second MODIS user log on to their dedicated workstations at GSFC	System should allow 15th person to log onto their IST	



81.	IST	Have the fourth CERES user attempt to log on to their dedicated workstations at Langley	System should not allow 16th person to log onto their IST	
ICT 13.3.3 Management Mode tests - ensure only one IST user for an instrument is in management mode				
82.	IST	Have one of the three CERES users log off their dedicated workstations at Langley		
83.	IST	Have one of the two CERES users not logged on, log on to their dedicated workstations at Langley in management mode		
84.	IST	Have the remaining CERES user attempt to log on to their dedicated workstations at Langley in management mode	Should not be allowed to log on because this would be the 16th person and someone is already logged in under CERES Management mode	
85.	IST	Have one of the two MODIS users logged on to their dedicated workstations at GSFC, log off		
86.	IST	Have the remaining CERES user attempt to log on to their dedicated workstations at Langley in management mode	Should not be allowed to log on because someone is already logged in under CERES Management mode	
87.	IST	Have the remaining CERES user log on to their dedicated workstations at Langley	Should be allowed to log on.	
88.	IST	Have the CERES user logged on in management mode log off	Does system give the CERES user who tried to log on in management mode any indication that management mode is now available?	
ICT 13.3.4 Joint test with EGS6 to ensure ASTER users (are not counted as part of the 15 users) don't effect 15 simultaneous IST users				

89.	IST	Have four CERES users log on to their dedicated workstations at Langley		
90.	IST	Have two MODIS users log on to their dedicated workstations at GSFC		
91.	IST	Have two MOPITT users log on to their dedicated workstations at Un of Toronto and at NCAR in Boulder		
92.	IST	Have two MISR users log on to their dedicated workstations at JPL		
93.	IST	Have four CERES users log on to their non-dedicated workstations at Langley		
94.	IST	Have three ASTER users log on to their workstations at ASTER-GDS		
95.	IST	Have one MISR user log on to their non-dedicated workstations at JPL	System should allow the MISR user to log on	
96.	IST	Have one MISR user log on to their non-dedicated workstations at JPL log off		
97.	IST	Have one of the two MODIS users logged on to their dedicated workstations at GSFC, log off		
98.	IST	Have the second MODIS users attempt to log on to their dedicated workstations at GSFC	System should allow 15th person to log onto their IST (ASTER IST users are not held against the count)	

Test Termination:

Step	Station	Action	Expected Results	Comments
1.	IST	Collect all necessary screen snaps, dumps, etc. needed for post-test analysis and verification		
2.	IST	Reconfigure the system to pre-test configuration		
3.	IST	Log off of the IST workstation		

## Appendix A

Paragraph ID	Text
EOC-2230#B	If conflicts cannot be resolved in EOS planning and scheduling, the EOC shall make a choice between competing activities based on negotiations with and between the ICCs or on a decision by the Project Scientist or his designee.
EOC-2240#B	The EOC shall reintroduce applicable requested activities in its planning and scheduling function when the activity did not occur due to a deviation from the schedule.
EOC-2250#A	The EOC shall be capable of performing its planning and scheduling function in batch and incremental interactive-user modes.
EOC-2250#B	The EOC shall be capable of performing its planning and scheduling function in batch and incremental interactive-user modes.
EOC-2260#B	The EOC shall provide "what-if" capabilities for planning and scheduling analysis, and provide them to authorized users, including the ICCs.
EOC-2270#A	The EOC shall accept an instrument resource profile or instrument resource deviation list (when a resource profile exists for the instrument) from each ICC.
EOC-2270#B	The EOC shall accept an instrument resource profile or instrument resource deviation list (when a resource profile exists for the instrument) from each ICC.
EOC-2272#A	For the instruments that have resource deviations lists, the EOC shall build instrument resource profiles by combining the resource deviation lists with the respective baseline resource profiles.
EOC-2272#B	For the instruments that have resource deviations lists, the EOC shall build instrument resource profiles by combining the resource deviation lists with the respective baseline resource profiles.
EOC-2290#A	Whenever the ICs instrument resource profile cannot be integrated into a preliminary resource schedule, the EOC shall provide the ICC with a notification that includes, at a minimum, an identification of the conflicting activities and the source of conflict.
EOC-2290#B	Whenever the ICCs instrument resource profile cannot be integrated into a preliminary resource schedule, the EOC shall provide the ICC with a notification that includes, at a minimum, an identification of the conflicting activities and the source of conflict.
EOC-2350#A	The EOC shall provide the preliminary resource schedule to the ICCs upon generation.
EOC-2350#B	The EOC shall provide the preliminary resource schedule to the ICCs upon generation.
EOC-2480#A	The EOC shall accept from each ICC an instrument activity list or an instrument activity deviation list (when an activity profile exists for the instrument) and any updates thereto.
EOC-2480#B	The EOC shall accept from each ICC an instrument activity list or an instrument activity deviation list (when an activity profile exists for the instrument) and any updates thereto.
EOC-2540#A	The EOC shall notify the ICC of any instrument activities that cannot be integrated into a detailed activity schedule.
EOC-2540#B	The EOC shall notify the ICC of any instrument activities that cannot be integrated into a detailed activity schedule.
EOC-2620#A	The EOC shall provide the ICC with the detailed activity schedule and any updates upon generation.

EOC-2620#B	The EOC shall provide the ICC with the detailed activity schedule and any updates upon generation.
EOC-3020#A	The EOC shall accept from the ICC instrument loads, SCC-stored instrument commands, and SCC-stored instrument tables as well as the associated information that includes at a minimum the following: a. Instrument identifier b. Schedule identifier, if applicable c. Identification of commands that could impact spacecraft or instrument safety (i.e., critical commands)
EOC-3020#B	The EOC shall accept from the ICC instrument loads, SCC-stored instrument commands, and SCC-stored instrument tables as well as the associated information that includes at a minimum the following: a. Instrument identifier b. Schedule identifier, if applicable c. Identification of commands that could impact spacecraft or instrument safety (i.e., critical commands)
EOC-3030#A	The EOC shall authenticate the originator of command information from the ICCs.
EOC-3030#B	The EOC shall authenticate the originator of command information from the ICCs.
EOC-3200#B	The EOC shall accept from the ICC instrument preplanned command groups for issuance by the EOC in the event of an anomaly that requires an immediate response or in the event that the ICC is unable to command the instrument.
EOC-3225#B	In support of a TOO observation or late change, the EOC shall prepare the corresponding integrated load and/or real-time instrument command set within 15 minutes of receipt of the SCC-stored instrument commands, SCC-stored instrument tables, or instrument load from the ICC, if the observation does not impact previously scheduled activities.
EOC-3226#B	In support of a TOO observation or late change, the EOC shall prepare the corresponding integrated load and/or real-time instrument command set within 1 hour of receipt of the SCC-stored instrument commands, SCC-stored instrument tables, or instrument load from the ICC, if the observation impacts previously scheduled activities.
EOC-4015#A	The EOC shall provide the capability to build real-time commands based on operator input and validate the generated commands.
EOC-4015#B	The EOC shall provide the capability to build real-time commands based on operator input and validate the generated commands.
EOC-4017#C	The EOC shall receive from the ICC instrument real-time command groups destined for the EOS spacecraft and instruments.
EOC-4166#B	The EOC shall provide the ICC with instrument uplink status, which includes at a minimum the following: a. Receipt at the EOC b. Validation status c. Receipt at the spacecraft and instrument
EOC-4168#B	The EOC shall provide the ICCs with instrument command notification messages, when emergency/contingency instrument commands are issued. \\1333, 946 \\
EOC-4210#B	The EOC shall process and output a single real-time emergency command within 500

	milliseconds of receiving the request from an ICC.
EOC-6020#A	The EOC shall accept instrument status data from each ICC.
EOC-6020#B	The EOC shall accept instrument status data from each ICC.
EOC-7015#A	The EOC shall receive from the ICCs instrument-specific portion of the PDB and/or any updates thereto.
EOC-7015#B	The EOC shall receive from the ICCs instrument-specific portion of the PDB and/or any updates thereto.
EOC-7125#C	The EOC shall provide spacecraft status data to an ICC.
EOSD1500#B	ECS shall interface with the EOS spacecraft and with the EOS instruments in order to perform mission operations, including planning, scheduling, commanding, and monitoring functions.
ICC-0010#B	The GSFC ICC shall be responsible for planning, scheduling, commanding, and monitoring the instruments allocated to GSFC in Table D-1, Instrument Manifest.
ICC-0020#B	The ICC shall be capable of interfacing with one or more local and/or remote ISTs for the instrument supported by the ICC.
ICC-0030#A	The ICC shall have the capability to notify the TL or instrument PI at the IST of, at a minimum, the following: a. Conflicts found in planning and scheduling.
ICC-0030#B	The ICC shall have the capability to notify the TL or instrument PI at the IST of, at a minimum, the following: a. Conflicts found in planning and scheduling b. Arrival of instrument engineering data c. Instrument anomalies found during instrument monitoring
ICC-0055#A	The ICC shall interface with EDOS for coordinating EDOS-provided services (e.g., data delivery service messages, status).
ICC-0055#B	The ICC shall interface with EDOS for coordinating EDOS-provided services (e.g., data delivery service messages, status).
ICC-0070#B	The ICC shall be capable of accommodating instrument team-provided software and/or hardware to perform functions such as: a. Planning b. Scheduling c. Analysis d. Onboard microprocessor management
ICC-1130#B	In support of a TOO observation, the ICC shall be able to evaluate the corresponding request within 30 minutes.
ICC-1150#C	The ICC shall be capable of using predicted orbit data and related information for the U.S. spacecraft, to determine the times during which specified targets will be within view of the specified instruments.
ICC-2010#A	The ICC shall have the capability to access the EOC planning and scheduling information.
ICC-2010#B	The ICC shall have the capability to access the EOC planning and scheduling information.
ICC-2015#B	The ICC shall have the capability to access and execute EOC "what-if" functions for planning and scheduling analysis.
ICC-2050#A	The ICC shall identify and resolve instrument planning and scheduling conflicts of its

	<p>instrument based on, at a minimum, the following:</p> <ul style="list-style-type: none"> <li>a. Resource and time constraints</li> <li>b. In situ observation dependency</li> <li>c. Coordinated observation dependency among instruments</li> <li>d. Priorities set by the LTSP and LTIP</li> </ul>
ICC-2050#B	<p>The ICC shall identify and resolve instrument planning and scheduling conflicts of its instrument based on, at a minimum, the following:</p> <ul style="list-style-type: none"> <li>a. Resource and time constraints</li> <li>b. In situ observation dependency</li> <li>c. Coordinated observation dependency among instruments</li> <li>d. Priorities set by the LTSP and LTIP</li> </ul>
ICC-2052#B	<p>The ICC shall generate the instrument baseline activity profiles, based upon the LTIPs for the applicable instrument.</p>
ICC-2060#B	<p>The ICC shall reintroduce applicable requested activities in its planning and scheduling function when the activity did not occur due to a deviation from the schedule.</p>
ICC-2110#B	<p>The ICC shall be capable of converting PI/TL provided instrument deviation requests into scheduling directives suitable for inclusion in its instrument resource profile.</p>
ICC-2115#B	<p>The ICC shall have the capability to plan and schedule instrument maintenance activities.</p>
ICC-2140#A	<p>At least once each week, the ICC shall build an instrument resource profile or an instrument resource deviation list (when a baseline resource profile exists for the instrument), which includes a description of instrument operations currently planned for the target week.</p>
ICC-2140#B	<p>At least once each week, the ICC shall build an instrument resource profile or an instrument resource deviation list (when a baseline resource profile exists for the instrument), which includes a description of instrument operations currently planned for the target week.</p>
ICC-2150#A	<p>The ICC shall accept from the EOC a notification of rejection of its instrument activities proposed in the instrument resource profile or instrument resource deviation list.</p>
ICC-2150#B	<p>The ICC shall accept from the EOC a notification of rejection of its instrument activities proposed in the instrument resource profile or instrument resource deviation list.</p>
ICC-2170#B	<p>The GSFC ICC architecture shall be capable of growing to support additional instruments without major redesign.</p>
ICC-2190#A	<p>The ICC shall build or update its instrument resource profile, or when a resource profile exists, its instrument resource deviation list, based, at a minimum, on the following:</p> <ul style="list-style-type: none"> <li>a. PI/TL provided instrument deviation requests</li> <li>b. LTSP and LTIP</li> <li>c. Current resource availability</li> <li>d. Current predicted orbit data and related information</li> </ul>
ICC-2190#B	<p>The ICC shall build or update its instrument resource profile, or when a resource profile exists, its instrument resource deviation list, based, at a minimum, on the</p>

	<p>following:</p> <ul style="list-style-type: none"> <li>a. PI/TL provided instrument deviation requests</li> <li>b. LTSP and LTIP</li> <li>c. Current resource availability</li> <li>d. Current predicted orbit data and related information</li> <li>e. Rejection notification from the EOC of activities that can not be accommodated in the preliminary resource schedule</li> <li>f. Existing preliminary resource schedule</li> </ul>
ICC-2210#A	The ICC shall ensure that its instrument resource profile contains no internal conflicts.
ICC-2210#B	The ICC shall ensure that its instrument resource profile contains no internal conflicts.
ICC-2220#A	The ICC shall be able to generate the instrument resource profile in both machine usable and human readable forms.
ICC-2220#B	The ICC shall be able to generate the instrument resource profile in both machine usable and human readable forms.
ICC-2230#A	When generated, the ICC shall provide the EOC with its instrument resource profile or, when a resource profile exists, an instrument resource deviation list.
ICC-2230#B	When generated, the ICC shall provide the EOC with its instrument resource profile or, when a resource profile exists, an instrument resource deviation list.
ICC-2250#A	The ICC shall accept the preliminary resource schedule from the EOC.
ICC-2250#B	The ICC shall accept the preliminary resource schedule from the EOC.
ICC-2270#A	For each day the ICC shall be capable of generating or updating, an instrument activity list or an instrument activity deviation list (when an activity profile exists for the instrument) nominally covering the next 7 days.
ICC-2270#B	For each day the ICC shall be capable of generating or updating, an instrument activity list or an instrument activity deviation list (when an activity profile exists for the instrument) nominally covering the next 7 days.
ICC-2280#A	<p>The ICC shall generate or update the instrument activity list, or when a baseline activity profile exists, the instrument activity deviation list, based, at a minimum, on the following:</p> <ul style="list-style-type: none"> <li>a. PI/TL provided instrument deviation requests.</li> <li>b. LTSP and LTIP</li> <li>c. Preliminary resource schedule</li> <li>d. Current resource availability information</li> <li>e. Current predicted orbit data and related information</li> <li>f. Responses to contingency/emergency conditions</li> <li>g. Rejection notification from the EOC of the activities that cannot be accommodated in the detailed activity schedule</li> </ul>
ICC-2280#B	<p>The ICC shall generate or update the instrument activity list, or when a baseline activity profile exists, the instrument activity deviation list, based, at a minimum, on the following:</p> <ul style="list-style-type: none"> <li>a. PI/TL provided instrument deviation requests.</li> <li>b. LTSP and LTIP</li> </ul>



	<ul style="list-style-type: none"> <li>c. Preliminary resource schedule</li> <li>d. Current resource availability information</li> <li>e. Current predicted orbit data and related information</li> <li>f. Responses to contingency/emergency conditions</li> <li>g. Rejection notification from the EOC of the activities that cannot be accommodated in the detailed activity schedule</li> </ul>
ICC-2290#A	<p>The ICC shall generate the instrument activity list or the instrument activity deviation list (when an activity profile exists for the instrument) in both machine-usable and human-readable forms, to describe for each activity, at a minimum, as many of the following that apply:</p> <ul style="list-style-type: none"> <li>a. Activity identifier including traceability to PI/TL provided deviation requests.</li> <li>b. Objectives</li> <li>c. Resource requirements</li> <li>d. Start time constraints and duration</li> <li>e. Instrument modes as a function of time</li> <li>f. Pointing angles and field of view (FOV)</li> <li>g. Specified tolerance limits</li> <li>h. Disturbances caused for each instrument mode</li> </ul>
ICC-2290#B	<p>The ICC shall generate the instrument activity list or the instrument activity deviation list (when an activity profile exists for the instrument) in both machine-usable and human-readable forms, to describe for each activity, at a minimum, as many of the following that apply:</p> <ul style="list-style-type: none"> <li>a. Activity identifier including traceability to PI/TL provided deviation requests.</li> <li>b. Objectives</li> <li>c. Resource requirements</li> <li>d. Start time constraints and duration</li> <li>e. Instrument modes as a function of time</li> <li>f. Pointing angles and field of view (FOV)</li> <li>g. Specified tolerance limits</li> <li>h. Disturbances caused for each instrument mode</li> </ul>
ICC-2300#A	The ICC shall accept from the EOC a notification of rejection of instrument activities.
ICC-2300#B	The ICC shall accept from the EOC a notification of rejection of instrument activities.
ICC-2350#B	In support of a TOO observation or a late change, the ICC shall update the instrument activity list or the instrument activity deviation list (when an activity profile exists for the instrument) within 8 hours, if the corresponding observation or the late change affects existing instrument activities or creates new conflicts.
ICC-2370#B	In support of a TOO observation, the ICC shall update the instrument activity list or the instrument activity deviation list (when an activity profile exists for the instrument) within 30 minutes, if the corresponding observation or the late change does not affect existing instrument activities or create new conflicts.
ICC-2380#B	In support of a late change, the ICC shall be capable of updating the instrument activity list within 75 minutes, if the request for instrument support activity does not affect existing instrument activity list events or create new conflicts.
ICC-2390#A	The ICC shall provide the EOC with the instrument activity list or instrument activity deviation list (when an activity profile exists for the instrument) and any

	updates thereto, when generated.
ICC-2390#B	The ICC shall provide the EOC with the instrument activity list or instrument activity deviation list (when an activity profile exists for the instrument) and any updates thereto, when generated.
ICC-2400#A	The ICC shall have the capability to update the instrument activity list or instrument activity deviation list (when an activity profile exists for the instrument) in response to instrument malfunctions or other special events that affect the continuation of the existing schedule.
ICC-2400#B	The ICC shall have the capability to update the instrument activity list or instrument activity deviation list (when an activity profile exists for the instrument) in response to instrument malfunctions or other special events that affect the continuation of the existing schedule.
ICC-3010#A	The ICC shall validate SCC-stored instrument tables, as appropriate, that are generated at the ICC.
ICC-3010#B	The ICC shall validate instrument loads, SCC-stored instrument commands, and/or SCC-stored instrument tables, as appropriate, that are generated at the ICC.
ICC-3020#B	The ICC shall accept the detailed activity schedule or its updates from the EOC.
ICC-3040#A	The ICC shall be capable of generating, at least once each day, instrument loads, SCC-stored instrument commands based on the detailed activity schedule.
ICC-3040#B	The ICC shall be capable of generating, at least once each day, instrument loads, SCC-stored instrument commands, and/or SCC-stored instrument tables based on the detailed activity schedule.
ICC-3050#B	The ICC shall be able to generate a command-to-memory location map for instrument-stored command loads.
ICC-3060#B	The ICC shall generate and validate, in less than 1 hour, the instrument loads, SCC-stored instrument commands, and/or SCC-stored instrument tables for 24 hours of operation of its instrument.
ICC-3070#B	In support of a TOO observation or late change, the ICC shall generate and validate the corresponding commands within 25 minutes of receiving an updated detailed activity schedule from the EOC, if the corresponding observation does not impact previously scheduled activities.
ICC-3071#B	In support of a TOO observation, the ICC shall be capable of generating and validating the corresponding commands within 55 minutes of receiving an updated detailed activity schedule from the EOC, if the corresponding observation impacts previously scheduled activities.
ICC-3085#B	In support of a late change, the ICC shall be capable of generating and validating the corresponding commands within 115 minutes of receiving an updated detailed activity schedule from the EOC, if the corresponding activity impacts previously scheduled activities.
ICC-3090#A	The ICC shall generate, validate, and store, as command groups, preplanned instrument commands for later use in emergency situations to protect the health and safety of its instrument.
ICC-3090#B	The ICC shall generate, validate, and store, as command groups, preplanned instrument commands for later use in emergency situations to protect the health and safety of its

	instrument.
ICC-3100#A	The ICC shall be able to generate, validate, and store preplanned contingency instrument commands to support specific TOO observations.
ICC-3100#B	The ICC shall be able to generate, validate, and store preplanned contingency instrument commands to support specific TOO observations.
ICC-3110#A	The ICC shall be able to generate, validate, and store preplanned contingency instrument commands to be used in event of instrument anomalies.
ICC-3110#B	The ICC shall be able to generate, validate, and store preplanned contingency instrument commands to be used in event of instrument anomalies.
ICC-3210#A	The ICC shall provide the EOC with instrument loads, SCC-stored instrument commands, SCC-stored instrument tables, preplanned real-time instrument commands, and associated information that includes, at a minimum, the following: <ul style="list-style-type: none"> <li>a. Instrument identifier</li> <li>b. Schedule identifier, if applicable</li> <li>c. Critical command information</li> </ul>
ICC-3210#B	The ICC shall provide the EOC with instrument loads, SCC-stored instrument commands, SCC-stored instrument tables, preplanned real-time instrument commands, and associated information that includes, at a minimum, the following: <ul style="list-style-type: none"> <li>a. Instrument identifier</li> <li>b. Schedule identifier, if applicable</li> <li>c. Critical command information</li> </ul>
ICC-3230#B	The ICC shall evaluate a command request from the IST against the current detailed activity schedule to determine whether it can be met with the corresponding commands without impacting previously scheduled activities.
ICC-3262#C	In support of a TOO observation or a late change, the ICC shall transfer the corresponding command request to the EOC within 5 minutes of generation and validation of the commands.
ICC-3270#A	The ICC shall be able to generate and validate emergency/contingency instrument command groups in emergency/contingency situations.
ICC-3270#B	The ICC shall be able to generate and validate emergency/contingency instrument command groups in emergency/contingency situations.
ICC-3280#C	The ICC shall have the capability to provide the EOC with instrument command groups, within 1 minute of a predefined emergency/contingency situation.
ICC-3300#C	The ICC shall be capable of retrieving validated and stored instrument command groups and initiating transfer to the EOC, within 1 second of operator initiation.
ICC-3360#C	The ICC shall provide an instrument command group with a single emergency instrument command to the EOC within 200 milliseconds of operator initiation.
ICC-3370#B	The ICC shall provide the capability to verify the successful receipt and execution of instrument commands.
ICC-3430#C	The ICC shall accept from the EOC command notification messages when emergency/contingency instrument commands are issued by the EOC.
ICC-4020#A	The ICC shall provide the capability to accept CCSDS packets from EDOS containing at a minimum the following data types: <ul style="list-style-type: none"> <li>a. Spacecraft and instrument housekeeping data</li> <li>b. Instrument engineering data or instrument science data within which instrument</li> </ul>

	engineering data is embedded c. Instrument memory dump data
ICC-4020#B	The ICC shall provide the capability to accept CCSDS packets from EDOS containing at a minimum the following data types: a. Spacecraft and instrument housekeeping data b. Instrument engineering data or instrument science data within which instrument engineering data is embedded c. Instrument memory dump data
ICC-4045#A	The ICC shall provide the capability to extract instrument housekeeping data and relevant spacecraft parameters from the spacecraft and instrument housekeeping data stream.
ICC-4045#B	The ICC shall provide the capability to extract instrument housekeeping data and relevant spacecraft parameters from the spacecraft and instrument housekeeping data stream.
ICC-4050#B	The ICC shall be capable of extracting instrument engineering data from instrument science data.
ICC-4060#B	The ICC shall support all EOS telemetry formats for instrument engineering data.
ICC-4070#B	The ICC shall provide the capability to receive and report data quality information with the incoming CCSDS packets as provided by EDOS.
ICC-4090#A	The ICC shall provide the capability to detect and report gaps in the telemetry data it receives.
ICC-4090#B	The ICC shall provide the capability to detect and report gaps in the telemetry data it receives.
ICC-4095#B	The ICC shall provide the capability to receive and process, non-telemetry data, which includes at a minimum the following: a. Monitor blocks from the DSN, GN, and WOTS b. Status messages from EDOS
ICC-4100#A	The ICC shall have the capability to perform instrument housekeeping and engineering data processing, which include: a. Decommuration b. Engineering unit conversion c. Limit checking, flagging out-of-limit parameters
ICC-4100#B	The ICC shall have the capability to perform instrument housekeeping and engineering data processing, which include: a. Decommuration b. Engineering unit conversion c. Limit checking, flagging out-of-limit parameters
ICC-4110#B	The ICC shall support the definition of sets of multiple sets of boundary limits for each non-discrete parameter, with each set including definitions for one or more upper and lower boundaries.
ICC-4120#B	The ICC shall provide the capability to accept temporary or permanent changes to limit definitions.
ICC-4130#B	The ICC shall have the capability to continuously process instrument housekeeping and engineering data in real time as it is being received.
ICC-4150#A	The ICC shall have the capability to provide event messages whenever a

	predetermined number of limit violations for a parameter is detected.
ICC-4150#B	The ICC shall have the capability to provide event messages whenever a predetermined number of limit violations for a parameter is detected.
ICC-4160#C	The ICC shall have the capability to process spacecraft recorder instrument housekeeping and engineering data to determine instrument health and safety.
ICC-4170#B	The ICC shall provide the capability to determine the best estimate for instrument memory contents.
ICC-4410#A	The ICC shall provide the capability to perform analysis on real-time data, spacecraft recorder data, and data from the ICC history log.
ICC-4410#B	The ICC shall provide the capability to perform analysis on real-time data, spacecraft recorder data, and data from the ICC history log.
ICC-4420#A	The ICC shall receive spacecraft status data from the EOC.
ICC-4420#B	The ICC shall receive spacecraft status data from the EOC.
ICC-4440#B	The ICC shall provide the capability to determine, for specified parameters over a specified time interval, at a minimum the following: <ul style="list-style-type: none"> <li>a. Minimum value</li> <li>b. Maximum value</li> <li>c. Mean value</li> <li>d. Standard deviation of the parameter</li> <li>e. Time and duration of limit violations</li> </ul>
ICC-4450#A	The ICC shall provide the capability to plot specified parameters against other specified parameters or against time.
ICC-4450#B	The ICC shall provide the capability to plot specified parameters against other specified parameters or against time.
ICC-4460#A	The ICC shall provide the capability to time-correlate related instrument parameters.
ICC-4460#B	The ICC shall provide the capability to time-correlate related instrument parameters.
ICC-4470#A	The ICC shall provide the capability to define, check, and manage instrument-specific operations procedures.
ICC-4470#B	The ICC shall provide the capability to define, check, and manage instrument-specific operations procedures.
ICC-4480#B	The ICC shall have the capability to monitor and evaluate instrument environmental parameters.
ICC-4490#A	The ICC shall provide the capability for trend analysis of instrument parameters.
ICC-4490#B	The ICC shall provide the capability for trend analysis of instrument parameters.
ICC-4500#B	The ICC shall provide the capability to generate instrument performance data based on the processing of instrument housekeeping data and instrument engineering data.
ICC-4510#B	The ICC shall have the capability to generate instrument status data based on instrument performance data and instrument anomaly data.
ICC-4520#C	The ICC shall provide instrument status data to the EOC, periodically or upon detection of anomalies.
ICC-4540#B	The ICC shall monitor the configuration of the instrument.
ICC-4545#B	The ICC shall have the capability to recommend instrument reconfigurations.
ICC-4550#A	The ICC shall have the capability to compare and display selected instrument telemetry parameter values with the expected values based on, at a minimum the following: <ul style="list-style-type: none"> <li>a. Scheduled instrument operational mode</li> </ul>

	<ul style="list-style-type: none"> <li>b. Trend analysis</li> <li>c. Instrument-specific telemetry information in the IDB</li> </ul>
ICC-4550#B	<p>The ICC shall have the capability to compare and display selected instrument telemetry parameter values with the expected values based on, at a minimum the following:</p> <ul style="list-style-type: none"> <li>a. Scheduled instrument operational mode</li> <li>b. Trend analysis</li> <li>c. Instrument-specific telemetry information in the IDB</li> </ul>
ICC-4560#A	The ICC shall maintain a record of the instrument configuration, including the state of instrument subsystems.
ICC-4560#B	The ICC shall maintain a record of the instrument configuration, including the state of instrument subsystems.
ICC-4570#B	The ICC shall provide the capability to maintain a master ground image of the instrument memory.
ICC-4580#B	The ICC shall provide the capability to compare the master ground image and the instrument memory dump.
ICC-4590#B	The ICC shall provide the capability to detect, isolate, and resolve instrument failures and anomalies.
ICC-4600#B	<p>The ICC shall accept from the IST at a minimum the following:</p> <ul style="list-style-type: none"> <li>a. Instrument anomaly notifications and instructions</li> <li>b. PI/TL analysis results</li> <li>c. Calibration information</li> </ul>
ICC-4710#A	<p>The ICC Instrument Data Base (IDB) shall include at a minimum the following:</p> <ul style="list-style-type: none"> <li>a. Instrument housekeeping data formats</li> <li>b. Instrument engineering data formats</li> <li>c. Housekeeping and engineering parameter descriptions</li> <li>d. Command descriptions</li> <li>e. Syntactical rules for commands and operator directives</li> <li>f. Operator directives</li> <li>g. Display formats</li> <li>h. Planning and scheduling definitions and constraints</li> <li>i. Analysis algorithms</li> <li>j. Report formats</li> <li>k. Derived telemetry parameter equations</li> <li>l. Parameter limits</li> <li>m. Instrument characteristics</li> <li>n. Command validation parameters</li> </ul>
ICC-4710#B	<p>The ICC Instrument Data Base (IDB) shall include at a minimum the following:</p> <ul style="list-style-type: none"> <li>a. Instrument housekeeping data formats</li> <li>b. Instrument engineering data formats</li> <li>c. Housekeeping and engineering parameter descriptions</li> <li>d. Command descriptions</li> <li>e. Syntactical rules for commands and operator directives</li> <li>f. Operator directives</li> <li>g. Display formats</li> <li>h. Planning and scheduling definitions and constraints</li> </ul>

	<ul style="list-style-type: none"> <li>i. Analysis algorithms</li> <li>j. Report formats</li> <li>k. Derived telemetry parameter equations</li> <li>l. Parameter limits</li> <li>m. Instrument characteristics</li> <li>n. Command validation parameters</li> </ul>
ICC-4720#B	The ICC shall maintain the latest two versions of the IDB.
ICC-4730#A	The ICC shall have the capability to modify records in the IDB.
ICC-4730#B	The ICC shall have the capability to modify records in the IDB.
ICC-4740#A	The ICC shall provide syntax and structure checking of the IDB.
ICC-4740#B	The ICC shall provide syntax and structure checking of the IDB.
ICC-4760#A	The ICC shall generate a report identifying any problems with the contents of the IDB.
ICC-4760#B	The ICC shall generate a report identifying any problems with the contents of the IDB.
ICC-4775#A	The ICC shall provide the EOC with the instrument-specific portion of the PDB and/or updates thereto.
ICC-4775#B	The ICC shall provide the EOC with the instrument-specific portion of the PDB and/or updates thereto.
ICC-4780#A	<p>The ICC shall maintain a history log of instrument and ICC activities for at least 7 days, including at a minimum the following:</p> <ul style="list-style-type: none"> <li>a. All messages sent and received</li> <li>b. Engineering and housekeeping data</li> <li>c. Operator requests/directives and responses</li> <li>d. Commands</li> <li>e. Microprocessor loads and dumps</li> <li>f. Limits violations</li> <li>g. Error conditions</li> <li>h. Instrument status data</li> <li>i. Executed schedules</li> <li>j. Analysis results</li> <li>k. Instrument calibration parameters</li> <li>l. Spacecraft status information</li> <li>m. ICC reconfiguration information</li> </ul>
ICC-4780#B	<p>The ICC shall maintain a history log of instrument and ICC activities for at least 7 days, including at a minimum the following:</p> <ul style="list-style-type: none"> <li>a. All messages sent and received</li> <li>b. Engineering and housekeeping data</li> <li>c. Operator requests/directives and responses</li> <li>d. Commands</li> <li>e. Microprocessor loads and dumps</li> <li>f. Limits violations</li> <li>g. Error conditions</li> <li>h. Instrument status data</li> <li>i. Executed schedules</li> <li>j. Analysis results</li> <li>k. Instrument calibration parameters</li> </ul>

	l. Spacecraft status information m. ICC reconfiguration information
ICC-4790#A	The ICC shall be capable of extracting data sets from the history log by specifying time and data type.
ICC-4790#B	The ICC shall be capable of extracting data sets from the history log by specifying time and data type.
ICC-6005#A	The ICC shall have the capability to schedule its systems and communications interfaces that are used for its instrument operations and for other activities including maintenance, upgrade, sustaining engineering, testing, and training.
ICC-6005#B	The ICC shall have the capability to schedule its systems and communications interfaces that are used for its instrument operations and for other activities including maintenance, upgrade, sustaining engineering, testing, and training.
ICC-6010#B	The ICC shall participate in the scheduling of interface and end-to-end tests with the external elements involved including the EOC, the SMC for other EOS elements, and EDOS for MO&DSD data delivery systems.
ICC-6020#A	The ICC shall establish its configuration, including functional connectivity within the ICC and between the ICC and external interfaces, for its instrument operations, tests, and maintenance.
ICC-6020#B	The ICC shall establish its configuration, including functional connectivity within the ICC and between the ICC and external interfaces, for its instrument operations, tests, and maintenance.
ICC-6030#B	The ICC shall perform prepass operational readiness tests on the ICC and between the ICC and external interfaces (via test messages).
ICC-6040#A	The ICC shall support ongoing operations.
ICC-6040#B	The ICC shall support reconfiguration to work around ICC faults and anomalies without interrupting other ongoing operations.
ICC-6060#A	The ICC shall allow operator override for ICC reconfiguration requests that violate operational constraints.
ICC-6060#B	The ICC shall allow operator override for ICC reconfiguration requests that violate operational constraints.
ICC-6070#A	The ICC shall manage initialization and shutdown of ICC functions.
ICC-6070#B	The ICC shall manage initialization and shutdown of ICC functions.
ICC-6090#B	The ICC shall alert the operator when its status changes or when data errors exceed operator-specified levels.
ICC-6110#B	The ICC shall manage its faults, including at a minimum the following: a. Fault identification b. Identification of recommended solutions c. Log of fault activities through resolution
ICC-6130#B	The ICC shall be capable of initiating diagnostics to aid in isolating internal faults, using safeguards to prevent their operations from affecting other operations.
ICC-6135#B	The ICC shall participate in the resolution of failures and anomalies involving the interfaces of the ICC.
ICC-6140#B	The ICC shall provide tests for validating, verifying, and checking functional capabilities and performance for ICC functions after the ICC has been repaired or upgraded.



ICC-6150#B	The ICC shall provide the capability to support the instrument integration test activities associated with the instrument testing, spacecraft and instrument integration testing, and launch site testing.
ICC-6510#A	The ICC shall provide the capability for the operator to control the ICC functions and components, utilizing a combination of input devices.
ICC-6510#B	The ICC shall provide the capability for the operator to control the ICC functions and components, utilizing a combination of input devices.
ICC-6520#A	The ICC shall provide the capability for the operator to send to displays, printers, and files spacecraft, instrument, and ground system information used or generated by each ICC function.
ICC-6520#B	The ICC shall provide the capability for the operator to send to displays, printers, and files spacecraft, instrument, and ground system information used or generated by each ICC function.
ICC-6525#A	The ICC shall provide the capability to notify the operator of events and alarms.
ICC-6525#B	The ICC shall provide the capability to notify the operator of events and alarms.
ICC-6540#A	<p>The ICC shall support the use of a high-level interactive control language, which consists of a set of directives and programming-like language capabilities, including at a minimum the following:</p> <ul style="list-style-type: none"> <li>a. Evaluate algebraic and logical expressions</li> <li>b. Exercise decision logic (IF statements)</li> <li>c. Automated execution of a set of multiple directives (i.e., user interface language procedure)</li> <li>d. Internally branch to other parts of the user interface language procedure</li> <li>e. Nest user interface language procedures within procedures</li> <li>f. Initiate other ICC applications</li> </ul>
ICC-6540#B	<p>The ICC shall support the use of a high-level interactive control language, which consists of a set of directives and programming-like language capabilities, including at a minimum the following:</p> <ul style="list-style-type: none"> <li>a. Evaluate algebraic and logical expressions</li> <li>b. Exercise decision logic (IF statements)</li> <li>c. Automated execution of a set of multiple directives (i.e., user interface language procedure)</li> <li>d. Internally branch to other parts of the user interface language procedure</li> <li>e. Nest user interface language procedures within procedures</li> <li>f. Initiate other ICC applications</li> </ul>
ICC-6580#A	The ICC shall provide the operator with the capability to create, modify, and delete user interface language procedures.
ICC-6580#B	The ICC shall provide the operator with the capability to create, modify, and delete user interface language procedures.
ICC-6600#A	The ICC shall respond to user inputs within 0.5 seconds.
ICC-6600#B	The ICC shall respond to user inputs within 0.5 seconds.
ICC-7060#A	<p>The IST shall have the capability to accept data from the Science Computing Facility (SCF), which include at a minimum the following data:</p> <ul style="list-style-type: none"> <li>a. Microprocessor memory loads</li> </ul>
ICC-7070#A	The IST shall have the capability to provide data to the SCF, which include at a

	<p>minimum the following data:</p> <p>a. Instrument analysis results</p>
ICC-8010#B	<p>The ICC shall be capable of supporting the following simultaneous activities:</p> <p>a. Performing mission coordination, planning, scheduling, monitoring, and commanding of its instruments.</p> <p>b. At least two of the following: mission test activities, ICC system upgrades, training, and/or maintenance.</p>
ICC-8020#B	<p>The ICC computer hardware shall be able to grow without redesign to twice the processing, storage, and communications capacities estimated for full system operation.</p>
ICC-8050#B	<p>When the ICC encounters a conflict while building or updating an instrument resource profile (or instrument resource deviation list), and the ICC does not have sufficient information to resolve the conflict, the ICC shall forward a request for its resolution to the PI/TL at the IST.</p>